



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,049	09/22/2003	Daniel Worledge	YOR920030275US1 (163-7)	7837
24336	7590	04/04/2005	EXAMINER	
KEUSEY, TUTUNJIAN & BITETTO, P.C. 14 VANDERVENTER AVENUE, SUITE 128 PORT WASHINGTON, NY 11050			NGUYEN, HOAI AN D	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/667,049

Applicant(s)

WORLEDGE, DANIEL

Examiner

Hoai-An D. Nguyen

Art Unit

2858

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 20-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-15 and 17-19 is/are rejected.
- 7) ☒ Claim(s) 7 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-19, in the reply filed on March 3, 2005 is acknowledged. The traversal is on the ground(s) that "serious burden would not be placed on the Examiner to search the common subject matter and examine both Group I and Group II claims together". This is not found persuasive because the elected subject matter and the non-elected subject matter direct to two patentably distinct species of the claimed invention as discussed in the election/restriction requirement office action mailed February 7, 2005. Even if the search areas for the elected subject matter might overlap the search areas for the non-elected subject matter, the examiner still has to search for distinctly inventive features. Therefore, it will give the examiner a serious burden while searching for the non-elected subject matter.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 20-29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on March 3, 2005.

Specification

3. The title of the invention is not descriptive. Based upon the election of Group I, a new title is required that is clearly indicative of the invention to which the elected claims are directed.

The following title is suggested: Multipoint Nanoprobe.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 5, 6, 10, 11, 14, 15 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kenan et al. (US 6,788,966).

Kenan et al. teach a diagnosis probe broadly interpreted as nanoprobe, which gives no meanings to the body of the claims, comprising:

With regard to claims 1 and 11, a substrate (FIGS. 3 and 4, printed circuit board 122) having a layer (FIG. 4, insulating substrate 150), which forms a projected portion (FIG. 4, distal end 168); and a plurality of conductive lines (FIG. 4, plurality of conductive wires 158) adhered to the projected portion and further extending beyond an end of the projected portion by a distance to form contact points (FIG. 4, sensing tips 108), wherein the lines are connected to material of the projected portion to provide stiffness and the contact points provide flexibility during use (Column 11, lines 15-30).

With regard to claims 2 and 11, the layer includes a dielectric layer (FIG. 4, insulating substrate 150) and the dielectric layer forms the projected portion (FIG. 4 and column 11, lines 15-30).

With regard to claims 5 and 14, the conductive lines are formed from a noble metal (Column 11, lines 42-44).

With regard to claims 6 and 15, the conductive lines are formed from one or more of Ag, Au, Pt, Ir, Ru, Pd and their alloys (Column 11, lines 42-44).

With regard to claims 10 and 19, the probe includes circuitry (FIG. 4, electronic boards 116) formed thereon (Column 10, lines 47-53).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenan et al. in view of Kitazume et al. (US 2003/0224627).

Kenan et al. teach all that is claimed as discussed in the above rejection of claims 1, 2, 5, 6, 10, 11, 14, 15 and 19, but they do not specifically teach the following:

- The substrate includes silicon and the dielectric layer includes at least one of silicon nitride and silicon oxide.

However, Kitazume et al. teach a probe card, probe card manufacturing method, and contact comprising:

- With regard to claims 3 and 12, the substrate includes silicon (Page 3, paragraph [0030], lines 1-10 and page 4, paragraph [0047]) and the dielectric layer includes at least one of silicon nitride and silicon oxide (Page 6, paragraph [0071]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diagnosis probe of Kenan et al. to incorporate the teaching

Art Unit: 2858

of a substrate including silicon and the dielectric layer including at least one of silicon nitride and silicon oxide taught by Kitazume et al. since Kitazume et al. teaches that such an arrangement is beneficial to provide a probe having a minute and highly accurate probe pin as disclosed in page 4, paragraph [0047].

8. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenan et al. in view of Asakawa et al. (US 6,649,516).

Kenan et al. teach all that is claimed as discussed in the above rejection of claims 1, 2, 5, 6, 10, 11, 14, 15 and 19, but they do not specifically teach the following:

- The conductive lines include a thickness of between about 1% and about 10% of a thickness of the projected portion.

However, Asakawa et al. teach a method for manufacturing a composite member from a porous substrate by selectively infiltrating conductive material into the substrate to form via and wiring regions comprising:

- With regard to claims 4 and 13, the conductive lines include a thickness of between about 1% and about 10% of a thickness of a single sheet of porous substrate (Column 19, lines 9-32).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diagnosis probe of Kenan et al. to incorporate the teaching of a thickness of conductive line between about 1% and about 10% of a thickness of a single sheet of porous substrate taught by Asakawa et al. since Asakawa et al. teaches that such an arrangement is beneficial to secure a sufficient electric insulation between the neighboring

Art Unit: 2858

wirings as well as to secure a sufficient electric conductivity of wirings as disclosed in column 19, lines 9-32.

9. Claims 8, 9, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenan et al. in view of Sudo (JP 04196428 A).

Kenan et al. teach all that is claimed as discussed in the above rejection of claims 1, 2, 5, 6, 10, 11, 14, 15 and 19, but they do not specifically teach the following:

- The conductive lines include a pitch of less than or equal to one micron.
- The pitch is less than or equal to 600 nm.

However, Sudo teach a manufacture of semiconductor device comprising:

- Individual thin conductors should be less than one micron, and the pitch of the parallel thin conductors should be as short as possible (see the CONSTITUTION).

With regard to claims 8, 9, 17 and 18, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the diagnosis probe of Kenan et al. to incorporate the teaching of conductive lines having a pitch of less than or equal to one micron or having a pitch less than or equal to 600 nm taught by Sudo since Sudo teaches that such an arrangement is beneficial to increase the number of conductors and thus to decrease the failure of metal wiring due to discontinuation as disclosed in the CONSTITUTION.

Allowable Subject Matter

10. Claims 7 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

- The primary reason for the indication of the allowability of claims 7 and 16 is the inclusion therein, in combination as currently claimed, of the limitation of conductive lines each have a thickness and a width, which are 300 nm, or less. This limitation is found in claims 7 and 16 is neither disclosed nor taught by the prior art of record, alone or in combination.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant's attention is invited to the followings whose inventions disclose similar devices.

- Bzdula (US 4,449,396) teaches a probe for measuring electrical conductance.
- Trenary (US 4,965,865) teaches a probe card for integrated circuit chip.
- Bachmann et al. (US 5,347,226) teach an array spreading resistance probe (ASRP) method for profile extraction from semiconductor chips of cellular construction.
- O'Neill (US 5,757,197) teaches a method and apparatus for electrically determining the presence, absence or level of a conducting medium, contamination notwithstanding.
- Hantschel et al. (US 6,668,628) teach a scanning probe system with spring probe (See FIGS. 11(A) and 11(B)).
- Kakushima et al. (Micro Electro Mechanical Systems, 2001. MEMS 2001. The 14th IEEE International Conference on 21-25 Jan 2001) teach micromachined

Art Unit: 2858

tools for nano technology. Twin nano-probes and nano-scale gap control by integrated microactuators (See Abstract and Introduction).

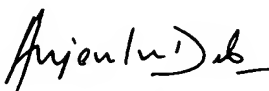
CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai-An D. Nguyen whose telephone number is 571-272-2170. The examiner can normally be reached on M-F (8:00 - 5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HADN


ANJAN DEB
PRIMARY EXAMINER

Hoai-An D. Nguyen
Examiner
Art Unit 2858
HADN